

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant : Ulrike Reeh, et al. Art Unit :
Serial No. : Examiner :
Filed : herewith
Title : Light-Radiating Semiconductor Component With A Luminescence
Conversion Element

Divisional of:
Serial No. : 09/221,789
Filed : December 28, 1998

Commissioner for Patents
Washington, D.C. 20231

PRELIMINARY AMENDMENT

Prior to examination, please amend the application as follows:

In the Specification:

At page 1, line 7, insert after "This" – is a divisional of U.S. application serial number 09/221,789, filed December 28, 1998, which--.

In the Claims:

Please add new claims 34-51 as follows:

--34. A light emitting device, comprising a light emitting component and a phosphor capable of absorbing a part of light emitted by the light emitting component and emitting light of wavelength different from that of the absorbed light; wherein said light emitting component comprises a gallium nitride based compound semiconductor and said phosphor contains a garnet fluorescent material comprising 1) at least one element

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selected from the group consisting of Y, Sc and La, and 2) at least one element selected from the group consisting of Al and Ga and being activated with cerium.--

--35. A light emitting device according to claim 34, wherein said gallium nitride based compound semiconductor is a gallium nitride semiconductor containing In.--

--36. A light emitting device according to claim 34, wherein said gallium nitride based compound semiconductor is represented by the formula: $Ga_xAl_{1-x}N$ or $Ga_xIn_{1-x}N$.--

--37. A light emitting device according to claim 34, wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material containing Y and Al.--

--38. A light emitting device according to claim 34, wherein the main emission peak of the light emitting component is set within the range from 420 nm to 460 nm and the main emission wavelength of the phosphor is set to be longer than the main emission peak of the light emitting component.--

--39. A light emitting device according to claim 38, wherein the light emitting layer of the light emitting component contains a gallium nitride semiconductor containing In, and the phosphor is an yttrium-aluminum-garnet fluorescent material.--

--40. An LED display device comprising the light emitting device according to claim 34 arranged in a matrix and a drive circuit which drives the LED display device according to display data which is input thereto.—

--41. A full-color LED display device comprising the light emitting device according to claim 34.--

--42. A light emitting diode comprising:
a mount lead having a cup and a lead;
an LED chip mounted in the cup of the mount lead with one of electrodes being electrically connected to the mount lead;
a transparent coating material filling the cup to cover the LED chip; and
a light emitting diode having a molding material which covers the LED chip covered with the coating material including the cup of the mount lead, the inner lead and another electrode of the LED chip, wherein

the LED chip is a nitride compound semiconductor and the coating material contains at least one element selected from the group consisting of Y, Sc and La, at least one element selected from the group consisting of Al, Ga and In.—

--43. A light emitting diode according to claim 42, wherein said nitride compound semiconductor is a gallium nitride based compound semiconductor.--

--44. A light emitting diode according to claim 43, wherein said gallium nitride based compound semiconductor is a gallium nitride semiconductor containing In.--

--45. A light emitting diode according to claim 43, wherein said gallium nitride based compound semiconductor is represented by the formula: $Ga_xAl_{1-x}N$ or $Ga_xIn_{1-x}N$.

--46. A light emitting diode according to claim 42, wherein the phosphor used contains an yttrium-aluminum-garnet fluorescent material that contains Y and Al.--

--47. A light emitting diode according to claim 42, wherein the main emission peak of the light emitting component is set within the range of 420 nm to 460 nm and the main emission wavelength of the phosphor is set to be longer than the main emission peak of the light emitting component.--

--48. A white light emitting diode comprising a light emitting component using a semiconductor as a light emitting layer and a phosphor which absorbs a part of the light emitted by the light emitting component and emits light of wavelength different from that of the absorbed light, wherein the light emitting layer of the light emitting component is a nitride compound semiconductor and the phosphor contains garnet fluorescent material activated with cerium which contains at least one element selected from the group consisting of Y, Sc and La, and at least one element selected from the group consisting of Al and Ga, and wherein the main emission peak of the light emitting component is set within the range from 420 nm to 460 nm and the main emission wavelength of the phosphor is set to be longer than the main emission peak of the light emitting component.

--49. A light emitting diode according to claim 42, wherein said nitride compound semiconductor is a gallium nitride based compound semiconductor.--

--50. A light emitting diode according to claim 43, wherein said gallium nitride based compound semiconductor is a gallium nitride semiconductor containing In.--

--51. A light emitting diode according to claim 43, wherein said gallium nitride based compound semiconductor is represented by the formula: $Ga_xAl_{1-x}N$ or $Ga_xIn_{1-x}N$.

REMARKS

Pursuant to 35 USC 135(b) and 37 CFR 1.607(c), applicants submit new claims 34-51, which have been substantially copied from claims 1, 2, 9, 10, 13-15 and 22-23 of U.S. Patent No. 5,998,925, issued on December 7, 1999. That patent claims priority from five Japanese applications.

The assignee of this application filed a Demand for Trial in Japan seeking to invalidate Japanese Patent No. 2927279 on March 3, 2000. That Japanese patent claims priority from three of the five Japanese applications just noted and includes claims that are directed to a light emitting diode including a fluorescent material having the general formula $(RE_{1-x}Sm_x)_3(Al_yGa_{1-y})O_{12}:Ce$. (See claim language at pages 2-5 of the Demand for Trial.) In that Demand for Trial, it is asserted that the Japanese Patent No. 2927279 is invalid under Japanese law on the basis of prior art and other reasons. The assignee of the Japanese Patent No. 2927279 filed a Written Reply arguing for the validity of Japanese Patent No. 2927279 on June 20, 2000. The Japanese authority deciding this matter has not yet rendered a decision. Applicants are planning to submit copies of these papers and the cited references in an information disclosure statement.

In order to preserve their rights with respect to claimed subject matter in an issued patent to another, applicants have presented these claims within one-year time period after issuance of the patent as required by 35 USC 135(b).

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Respectfully submitted,

Date: Dec. 6, 2000

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